CLAIMS

1. A rare earth-transition metal (RE-TM) alloy structure comprising a RE-TM alloy substrate and a diffusion barrier disposed thereon, wherein the diffusion barrier comprises a phosphate bonded ceramic wherein the rare earth is samarium.

2. A structure according to claim 1, wherein the RE-TM alloy is a Sm-Co-Cu-Fe-Zr magnetic alloy.

3. A structure according to claim 1 or 2, wherein the phosphate bonded ceramic diffusion layer is formed by a method which comprises applying to the alloy substrate a coating comprising a source of a ceramic-forming metal oxide and a source of a phosphate binder for the metal oxide, and causing the metal oxide and the phosphate to cure to form a diffusion barrier comprising a phosphate bonded ceramic on the alloy substrate.

4. A structure according to any preceding claim, wherein the ceramic is in contact with the alloy substrate on one side, the opposite side being exposed to the exterior environment.

5. A structure according to any preceding claim, which is a permanent magnet article.

6. A permanent magnet article of claim 5 which is an aerospace component..

7. A method of forming a diffusion barrier on a rare earth-transition metal (RE-TM) alloy substrate, the method comprising applying to the alloy substrate a coating comprising a source of a ceramic-forming metal oxide and a source of a phosphate binder for the metal oxide, and causing the metal oxide and the phosphate to cure to form a diffusion barrier comprising a phosphate bonded ceramic on the alloy substrate.

8. A method according to Claim 7, wherein the coating is applied in one step.

9. A method according to Claim 7 or 8, wherein the coating is applied as an acidic aqueous medium comprising the oxide source and the phosphate source.

10. A method according to any of Claims 7, 8 or 9, wherein the oxide source is selected from oxides and hydroxides of magnesium, aluminium, iron, chromium, sodium, zirconium and calcium, and any mixture or chemical or physical combination thereof.

11. A method according to Claim 10, wherein the oxide source is selected from magnesium oxide, chromium oxide and mixtures thereof.

12. A method according to any of Claims 7 to 11, wherein the phosphate source is selected from phosphoric acid and phosphates of potassium, aluminium, ammonium, beryllium, calcium, iron, lanthanum, lithium, magnesium, magnesium-sodium, magnesium-potassium, sodium, yttrium, zinc, zirconium, and any mixture or chemical or physical combination thereof.

13. A method according to any of Claims 7 to 11, wherein curing of the coating is initiated by heating the coating.

14. A method of reducing rare earth metal depletion at the surface of a RE-TM permanent magnet, which method comprises providing over the surface a diffusion barrier composed of a phosphate bonded ceramic.

15. A method according to claim 14, wherein the RE-TM permanent magnet is a SM-TM high temperature permanent magnet.